

## Translation

(Unofficial translation which should not be used in patent disputes)

Source: Japan. Kokai JP 54-60384 (1979)

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### 1. Title of the Invention

Manufacturing method for novel higher fatty acid esters of cellulosic fiber derivatives

### 2. Scope of Patent Claims

Manufacturing method for novel higher fatty acid esters of cellulosic fiber derivatives, characterized in that the cellulosic fibers are carboxymethylated, phosphated, sulfomethylated, sulfoethylated, para-aminobenzylated, aminoethylated, diethylaminoethylated, triethylaminoethylated or guanidinethylated, and then the cellulosic fiber derivative selected from the group containing the obtained carboxymethylcellulose, phosphocellulose, sulfomethylcellulose, sulfoethylcellulose, para-aminobenzylcellulose, aminoethylcellulose, diethylaminoethylcellulose, triethylaminoethylcellulose and guanidinethylcellulose is treated with a higher fatty acid halide in the presence of a base.

### 3. Detailed Description of the Invention

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The cellulosic fibers used as the raw materials of this invention include natural plant fibers such as cotton, linen, hemp, jute, ramie and manila flax. They are carboxymethylated, phosphated, sulfomethylated, sulfoethylated, para-aminobenzylated, aminoethylated, diethylaminoethylated, triethylaminoethylated or guanidinethylated to obtain the cellulosic fiber derivatives. These reactions are carried out according to the conventional methods used in the case of cellulose (*J. Am. Chem. Soc.*, **78**, 751 (1956)).

Next, these cellulosic fiber derivatives are treated with the higher fatty acid halides. In this reaction, the remaining cellulose hydroxyl groups present in the cellulosic fiber derivative are esterified, and the reaction can be carried out smoothly by adding a base in order to bind the hydrochloric acid formed as a by-product.

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Saturated or unsaturated fatty acid halides containing at least 6 carbon atoms are used as the higher fatty acid halide. Of course, mixtures containing higher fatty acid halides of varying

numbers of carbon atoms can be used. The higher fatty acids may also be chain-like, and their use is desirable when considering the effects on the enzyme adsorption ability of the product.

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In the present invention, the degree of esterification of the hydroxyl groups in the cellulosic fiber derivative depends on the reaction solvent, on the amount of the added acid halide and on the reaction time. Constant enzyme adsorption ability is obtained at a degree of esterification of about 8-10 % and, therefore, there are no restrictions for a more extensive esterification.

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When carboxymethylcellulose (CM-Ce) and phosphocellulose (P-Ce) derived from the cellulosic fibers according to the present invention are esterified with higher fatty acid halides, the product is obtained in the form of cloth or thread. It can be therefore packed in columns e.g. for purification of enzymes and a convenient support, which is easy to handle during use, is thus obtained.

### **Realization Example 1**

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3 g of the carboxymethylated gauze and 10 g of palmitoyl chloride were suspended in 40 mL of pyridine and stirred at 30 °C for 15 h. Then 100 mL of chloroform was added in the reaction mixture and the precipitate formed during further addition of 100 ml of ethanol was filtered off. The precipitate was washed with 200 mL of a chloroform:ethanol mixture (1:1) and then again with 100 ml of ethanol. After drying, 3.2 g of palmitic acid ester of CM-Ce was obtained.

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